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CZECHOSLOVAKIA

The Czechoslovakian Uranium Mines

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A. Jachymov Region (St. Joachimsthal)

1. Rovnost (Wernerschacht), 6 or 7 kilometers from Joachimsthal. Ore of this mine is particularly rich in uranium.

Approximate number of personnel:
80 Czech workers
250 German PW workers
20 Workers on the surface
2 Russian engineers
1 Czech engineer
5 German foremen

Production: 140 to 150 tons per month. The highest percentages in the ore are for tin, silver, and pitchblende. After successive sortings, 4.5 per cent to 7 per cent or ore is very rich and of great radioactivity. On the basis of 140 tons, there are 8,400 kilograms of pure pitchblende with 0.14 grams of uranium per 1,000 kilograms; that is, a minimum of 1.176 grams of uranium. Note: The 12th gallery is composed of radioactive bismuth which is also extracted but the production is only 100 kilograms per month.

Layout of the mine. Average depth: 650 to 700 meters. One main entrance with a gallery about 30 meters down in which equipment is stored (elevator down to the 12th gallery). There are two other entrances at the ends of the two galleries, but at present they are walled up. There are 15 main galleries from the center toward the north on one side and from the center toward the south on the other side. These galleries are at intervals of 50 meters except the first, which is 30 meters.

1st gallery (Albracht) at 50 meters
2nd gallery (Barbara) at 100 meters
3rd gallery (Daniel) at 150 meters
4th gallery (unnamed) at 200 meters
5th gallery (unnamed) at 250 meters
6th gallery (unnamed) at 300 meters
7th gallery (unnamed) at 350 meters
8th gallery (unnamed) at 400 meters
9th gallery (unnamed) at 450 meters
10th gallery (unnamed) at 500 meters
11th gallery (unnamed) at 550 meters
12th gallery (unnamed) at 600 meters
13th gallery (unnamed) at 650 meters
14th gallery (unnamed) at 700 meters

These galleries sometimes have a length of 1,000 meters. The 12th one is connected with the Svornost mine and the waste rock is carried away through this connection. Construction materials and other supplies can be transported by a small Diesel-powered train from the 10th, 11th, and 12th galleries to Svornost mine. In the same way, there is a connection between the 3rd gallery (Daniel) and the Svornost mine.

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2. Bratrstvi (Bruderschacht, probably for "Bruderschaft"), 1 kilometer from Joachimsthal station.

Bozi-Sen (Cottestraum, probably for "Gottestraum"), old silver and bismuth mine.

Approximate number of personnel:
- 90 Czech workers
- 200 German PW
- 50 Czech women
- 30 Workers on the surface
- 2 Russian engineers
- 1 Czech engineer
- 5 Czech foremen

This labor force is available for both Bozi-Sen and Bratrstvi.

Production: Approximately the same production as Rovnost mine.

Layout of mine. Depth of about 400 meters; actually is on a small hill. A main entrance is in the center of the hill and an adit on the side which also forms a gallery about 400 meters long. Six main galleries lead north and south from the center. There is also another gallery with an emergency exit to the surface but it is used mainly for pipes to remove water.

3. Svornost mine, 2 kilometers from Joachimsthal station.

Approximate number of personnel:
- 60 Czech workers
- 80 German PW
- 25 Workers on the surface
- 2 Russian engineers
- 1 Czech engineer
- 2 Czech foremen

Production: Production is average, but uranium content is slight, varying from one to three per cent. The quantity of ore extracted is unknown.

Layout of mine. Depth about 650 to 700 meters. One main, double entrance for rise and descent of the lift. One large air shaft. Two secondary entrances. 12 horizontal galleries leading north and south from the central shaft.

4. Elias mine, 1 kilomemter from Rovnost and 10 kilometers from Joachimsthal.

Approximate number of personnel:
- 40 Czech workers
- 60 German PW
- 15 Workers on the surface
- 2 Czech engineers
- 1 Russian engineer

[redacted]

Production: Mine has been opened only recently but the production is already important. 90 to 100 tons per month of ore with 6 per cent pitchblende - 6,000 kilograms per month with high uranium content - 0.840 grams per month of uranium.

Layout of mine. Depth of about 160 meters. Work at 40 meters and at 160 meters. A secondary gallery about 15 meters west of the main entrance driven to a depth of 40 meters and about 750 meters toward the south. There is very great radioactivity in this gallery and work is being pressed to extract the greatest possible amount of ore.

5. Irena mine, 1 kilometer from Rovnost and 10 kilometers from Joachimsthal.

Personnel: The labor force of Elias mine is also available for Irena mine. One Czech engineer and one Russian engineer who actually are assigned to Rovnost mine are on temporary duty at Elias and Irena mines.

Production: The mine has been opened only recently but its production is already important. 90 to 100 tons of ore per month with 6 per cent pitchblende - 6,000 kilograms per month with high uranium content - 0.840 grams of uranium per month. There are piles of waste rock dating to a rather remote period when only silver or tin was extracted from the mine. This waste rock is subjected to examination by detectors and found to contain the same proportion of pitchblende (this applies equally to Elias mine).

Layout of mine: Depth about 50 meters; connection with Elias mine being attempted. No further information.

6. Maria Antonieta mine, 1 kilometer from Joachimsthal.

Approximate number of personnel: 20 Czech workers
100 German PW
10 Workers on the surface

Any engineers who may be needed are generally assigned from the Elias or Svornost mines.

About 4 Czech and German foremen

Production: Unknown; mine being improved. No extraction at present.

Layout of mine: The main entrance is on the side of a small hill and extends 300 meters; no exit or entrance near the top of the hill.

B. Seify Region (Ryzovna)

1. Seify (Ryzovna)mine, 14 kilometers from Joachimsthal, toward Johanngeorgenstadt, Nejdek Okres. An old bauxite mine. Considered as richest uranium mine.

2. X....mine, 1 kilometer from Seify, newly opened, formerly a tin mine.

Approximate number of personnel:

Seify
- 20 Czech workers
- 100 German PW
- 10 to 15 Workers on the surface
- 1 Russian engineer
- 1 Czech engineer
- 3 to 4 German foremen

Production: At the present time, the total production of the mines of the Seify region is falling off because work is in progress in new installations. A year ago the production was about 30 tons per month of ore with 3.5 per cent carnotite (a uranium-vanadium mineral); that is, 1,050 kilograms of carnotite per month. Very little pitchblende. Carnotite has great industrial importance. It is a very rare mineral, found at Seify and in Colorado, USA.

Layout of mines: Depth about 180 meters. The principal entrance is on the side of a small hill and the shaft has been driven down 180 meters. At every 30 meters of depth there is a horizontal gallery which extends 200 meters in a north-south direction. However, between each of these galleries there is another drift which extends to a maximum length of 30 to 40 meters.

C. Breitenbach (Potucky) Region, 15 kilometers from Joachimsthal on the German border.

1. 5 Kveten (5 May) mine, opposite Johanngeorgenstadt.

2. X.... The galleries communicate with the German galleries, but at the present time are walled up.

Approximate number of personnel:

5 Kveten
- 40 Czech workers
- 150 German PW

X....
- 10 Workers on the surface
- 1 Czech engineer
- 1 Russian engineer
- 3 to 4 German foremen

Production: Construction work is still being carried out but the mine is producing 60 to 70 tons per month of ore with 3 or 4 per cent pitchblende - 2,275 kilograms of pitchblende which yield about 0.320 grams of uranium per month. Production of the second mine is unknown.

Layout of mines: Entrance on the side of a hill forming the mine shaft. One shaft inside with a depth of 130 meters with two galleries each 100 meters long.

SECRET

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D. Abertamy mine, 7 kilometers from Joachimsthal. [redacted] exploitation.

Approximate number of personnel:
30 Czech workers
80 German PW
10 Workers on the surface
1 Russian engineer
2 to 3 German Foreman.

Production; Expansion in progress; production unknown; production considered meager by the experts of Joachimsthal.

Layout of mine. Unknown.

E. Velsberg mine (Mont Vels), 7 kilometers from Joachimsthal near Abertamy mine; mine recently opened.

Approximate number of personnel:
50 Czech workers
50 German PW
10 to 15 Workers on surface
2 to 3 Czech foreman

The Velsberg mine works with the abertamy mine.

Production: Expansion in progress, shafts dug recently. Production unknown at present, but experts believe it well be good when everything is ready.

Layout of shafts unknown.

F. Horni Slavkov, 50 kilometers from Joachimsthal, near Marienbad, former silver mine; two shafts.

Approximate number of personnel:

Shaft No 1:
50 Czech workers
80 German PW
20 Workers on the sufface

Shaft No 2:
50 Czech workers
100 German PW
10 Workers on the surface
3 Russian engineers for the 2 shafts,
10 to 15 Czech and German Foremen.

Production. Meager at present. Both shafts date from 1946. After improvements, experts expect large yields.

Layout of mines: Two principal entrances, actually formingtwo mines; one shaft is 40 meters deep, the other is 60 meters deep. One horizontal gallery [redacted] which connects the two shafts.

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G. Prebuz, 40 kilometers from Joachimsthal, on the German border, in the direction of Cheb. Formerly a tin mine. Little activity, but exploration by geologists from Prague has not yet been completed.

Personnel. 20 Czech workers who help the 5 geologists who are at present exploring the mine. Extraction is temporarily suspended. The work in the mines is done by two or three gangs, each works 8 hours. The PW's usually work at night. Almost all the shafts are worked on Sunday, especially for cleaning and removal of the mined ore.

Production. No production yet, still under exploration by geologists. Mine is considered of great future interest.

Layout of mine unknown.

The managing personnel includes:

4 24S Gmelak, Czech, chief engineer, graduate of government schools. Director of exploitation and administrator of all the mines of the Joachimsthal region.

6SU Kalycev, Russian, graduate engineer, assistant to the director and chief of all the Russian engineers. Technical director of the mines. Well-known chemist. Political commissar of the Russians. Concerned only with skilled and unskilled Russian workers.

6SU Posik, Lauwa, Russian, head of the laboratory and of geology of Jachymov. Physics engineer.

6SU Tennebaum, Irena (wife of Lauwa Posik), Russian, Probably of German origin. Head of laboratory of geophysics. Physics engineer. Directs research and assaying. Well known in Russia.

6SU Chanov, Russian, head of PW campl

4 Stejskal, Czech, chief engineer and inspector of the mines of Rovnost and Elias.

4 24S Hruby, Czech. Head foreman at Rovnost. Especially concerned with the construction of new galleries.

6SU Lwouc, Russian. Geologist at Horni Slavkov. In charge of exploration on the surface and in the mines.

4 24S Calab, Czech, chief engineer of the Svornost mine.

4 24S Jurenka, Czech. Head of the mines at Seify. Formerly chief foreman. In charge of all work in the mine. Probably attended courses in mining at the university for several years.

6SU Komjagin, Russian. In charge of shipments to Russia. IN charge of the motor vehicles of all mines.

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Gregorian, Russian. Geologist at Rovnost. Prospects for ore in the mines.

Polikarpockin, Russian. Geologist at Svornost. Prospects for ore in the mines.

Grib, Russian. In charge of the workers and of the Russian employees. In charge of provisions for the workers.

Kudick, Otto, German. Former director of machine shop, has done research on detecting equipment.

Dick, Ernest, German, electrical engineer.

Peters (?), German. Geology engineer, specialist in prospecting for all types of ores. Former officer of German Air Force.

Living standards of the Workers.

Normally, each worker earns 96 crowns for 8 hours, plus a bonus of 20 per cent for high efficiency - 19.20 crowns for 8 hours. Those who work underground receive an additional bonus of 30 crowns. Consequently, the pay for 8 hours amounts to about 145 crowns.

All piece workers who exceed their established quota are paid 5 crowns for each kilogram of extracted ore. Piece workers always earn from 15 to 20 crowns in addition to their regular pay. They receive about 4,500 crowns per month after all deductions have been made - about 10,000 french francs. The average monthly pay of people working by the day is about 3,500 crowns. There is one pay day per month, but an advance may be requested on the fifteenth of the month. At the present cost of living, a workman can live rather comfortably.

Each ~~person working~~ worker at the mines is entitled to a hot meal upon completion of his 8 hours of work. For this he pays a small sum. He may also contract for meals by the day, in which case he takes his breakfast at the plant. Breakfast usually consists of 250 grams of bread and 50 grams of bacon. Board by the day costs from 15 to 20 crowns.

Each person working at the mines receives a T.4 ration card for high efficiency which entitles him to a bonus of four kilograms of bread per month, one kilogram of meat and 250 grams of lard above his normal ration. There is also a special card for those who have special duties atthe mines. With this card they can get monthly an additional 800 grams of meat, 500 grams of sugar, 250 grams of lard, and 500 grams of white bread. In lieu of meals at the canteen, the worker may purchase 2.5 kilograms of pork, 750 grams of lard, 1 kilogram of cheese, and chocolate or bonbons per month. To prevent workers from drinking the water in the mines, each receives half a liter of cow milk every day.

A rubber suit is given to each worker every year and he also receives free two pairs of rubber boots per year if there is a sufficient supply of

[redacted]

these. Generally the administration pays little attention to the ordinary clothing of its workers and they have to purchase many things (underwear) on the black market.

Disease are not common since all the workers at the mines have an X-ray every month. The most common are pulmonary ailments. However, vertigo and nausea are frequent after work, especially if the previous crew has done blasting. The wounds contracted in the course of underground work heal very slowly and sometimes not at all. Another common airment is loss of teeth; some workers lose almost all of their teeth after a year's work underground. Expectoration is rare but some workers, particularly those working around Joachimsthal, have contracted a disease which has the same symtoms as tuberculosis! Loss of hair is frequent among the underground workers.

Each newly hired worker is classified "0" with respect to disease. After working 6 months, the worker is classified "2" or "3"; that is, he has contracted some disease. The administration usually takes a very active interest in the sick. They are sent to special localities in Russia where there are convalescent centers, which have been created just for them.

Guarding of the Jachymov, Rovnost, Svornost, Seify, and Elias mines as well as all the buildings of the administration is done by the SNB (National Security Agency) police, that is the state police of the Czechoslovak Republic, and by mine police.

The other mines (Bratrstvi, Brietenbach, Slavkov, Abertamy, and Prebuz) are guarded only by mine police.

The SNB guards the mining area and the shafts, checks passes, and guards the PW's. Aided by the mine police, the SNB makes frequent patrols during the night. Russian, drum-fed, submachine guns are the weapons used. The number of guards varies according to the mine, but there are always from 10 to 15 guards in 2-hour shifts.

One SNB barracks is at Mariasorg, about six kilometers from Joachimsthal, in a very small village between Rovnost and Elias.

Another barracks is at Velsberg on ahill opposite Elias.

Another large post is in Jachymov and there is also a post opposite the administration headquarters.

The SNB force is between 300 and 350 men.

The mine police force is between 100 and 150 men.

At eadh administration headquarters there is also a guard ofsecret police in civilian clothes, probably member of the NKVD. There is a small garrison at Bozi Dar with the strenght of about 150 men.

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Extraction is done in the following manner:

The miner begins his work on the wall of the gallery at a spot which has been marked with white paint and which corresponds to a precise point on the detailed map. This point has been determined by the geologist who is a specialist in the detection of radioactive minerals.

The miner drills horizontal or vertical holes in the wall with a compressed air and water drill (American model). The depth of the holes is two meters.

These holes are charged with cartridges which are 15 centimeters long. The cartridges are loaded with a new, "safety" explosive called Donarit NH_3 and Na No.

After firing of the charges, the blasted rock is immediately sorted by hand and the pieces which contain the ore are put to one side. The waste rock is usually carried to the surface in mine carts.

The part which contains ore is also sent to the surface and put in strong rooms and crushed there. The worthless pieces are discarded and the rest is put in wooden chests which weigh from 80 to 100 kilograms when loaded. Here, too, the sorting is done by hand.

The chests are padlocked, loaded on trucks and dispatched to Bratrstvi under guard of two armed Czech head foremen.

The first testing center is at Bratrstvi. Here, the uranium content is determined by a new apparatus called L.R.24.

After the test, the waste is thrown away and any ore which shows traces of pitchblende is sent to an electric mill and ground to powder. This powder is then put into barrels which hold from 150 to 200 kilograms.

The barrels are loaded on trucks and shipped to Ostrov where they are stored. Later they are shipped by rail under armed guard to Russia (exact destination unknown.)

It is improbable that there have been any shipments of ore into Germany proper.

There are two laboratories in Joachimsthal:

1). A chemical laboratory under Mrs. Tennebraum (probably for Tennebaum) who is in charge of a number of other engineers and specialists. She, herself, hires the technical personnel giving examinations to the candidates.

This laboratory also tests minerals other than pitchblende; for example: silver, bauxite, bismuth, tin, and carnotite. However, the tests are made only to determine the uranium content.

Tests are also performed on the piles of waste rock left by the Germans after the extraction of various minerals. The waste rock is loaded on conveyor belts and examined by portable P.R.7 sets to determine the presence of uranium.

Another task which is reserved for the specialists of this laboratory is to check and prospect locations showing signs of radioactivity. These spots are immediately marked with white paint on the detailed map.

This laboratory sends specialists to the mines who give instructions to the head foreman for the actual exploitation.

2). A geophysics laboratory which directs the construction of new mines in places where radioactivity has been detected by the P.R.5 detector.

This laboratory is directed by Posik, who came specially from Russia.

Apparatus for determining radioactivity include:

A. P.R.5 Set

Model changed by the German engineers.

This apparatus consists of a box which is 40 centimeters long, 30 centimeters high, 20 to 25 centimeters wide and weighs 5 to 6 kilograms.

It is carried on the chest.

Inside of the box are one 60-volt battery, one 3-volt battery, six different condensers, one transformer, two radio tubes, and one Rhumstoff's (TN: Ruhmkorff's) coil.

Under glass, on the outside, is a switchboard with a voltmeter giving voltages up to two volts, one voltmeter for voltage up to 50 volts, one amperemeter scaled in milliamperes, three tuning knobs, and an on-off button.

This box is connected by a flexible cable with the probe and is carried on the chest.

The probe has the form of a cylindrical tube with a supporting handle and consists of one transformer, one condenser, two red radio tubes, one white radio tube, and a compartment holding a dehydrating chemical.

A glass tube in the shape of a T and having three electron counters is connected directly to the probe and forms part of it. Each electron counter is surrounded by a glass casing and enclosed in a copper shield. Recently the copper shield has been replaced by a graphite shield which should increase the sensitivity of the apparatus.

These envelopes are surrounded by a mixture of inert gases, argon, neon, and 10 per cent alcohol vapor.

Each counter can withstand a current up to 1,200 volts. The voltage used for detecting is from 600 to 800 volts.

The apparatus is equipped with earphones which register a sound (by impulse) when the electrons pass. The radio tubes function as in a radio set and serve to amplify the sound.

At the beginning of the detecting operation, voltmeter No 1 registers two volts, the other voltmeter registers 50 volts, and the milliamperemeter registers one milliampere.

According to the intensity of the radioactivity, the amperemeter registers up to 500 units regulated by a scale on turning successively knobs Nos 1, 2, and 3.

This apparatus, which is the most accurate, is used for laboratory work on spot detecting.

B. Apparatus L.R.24 (P.R.5 modified)

This apparatus is used to test the boxes and gives a rapid analysis of the content.

The apparatus has the shape of a table with three electron counters in each of the two sides and the top.

These nine tubes are connected to a station which has ampermeters to record the intensity of the radioactivity. This station is the same as the one for P.R.5 and is connected with a 220-volt line.

When in use, the three amperemeters can register up to 1,200 units after they are set.

This apparatus is used to measure the intensity of doubtful radioactive elements in the boxes which are slid under the table.

C. Apparatus of the type WIRG

This apparatus is the simplest, but also the oldest and consequently the least accurate.

It consists of a box weighing about 10 kilograms, 45 centimeters long, 30 centimeters high, and 25 centimeters wide.

Inside are three batteries of 300vvolts each, one of which is used as a spare, one battery of 30 volts, and one of 3 volts.

There is a switchboard with an electric chronometer, which does not operate at standard speed, one potentiometer, and one voltmeter.

A probe is connected to the apparatus by wire. The probe is very simple, being composed of a single radio tube and one electron counter.

The apparatus is portable and can be equipped with earphones.

The operation is the same as the P.R.5. An ordinary stopwatch is also used, as the detecting has to last one minute. The electric chronometer mounted on the apparatus turns at each impulse received from the passage of the electrons; each second on the electric chronometer is equivalent to 2.5 impulses.

An ordinary stopwatch is started and run for one minute. At the end of one minute on the stopwatch, the number on the electric chronometer is noted, and when this is multiplied by 2.5 the number of impulses is obtained.

This out-of-date apparatus is difficult to use and its operation is tricky.

D. Apparatus P.R.12.

This apparatus is quite old, being in use in 1946, and has not been modified because it is difficult to use, since it also has two chronometers like the preceding WIRG.

It has one box with one battery of 60 volts and two small batteries of 1.5 volts (a total of 3 volts). The apparatus is portable.

There is a second box which contains the transformer, two small radio tubes, and tuning knobs.

The operation is the same as the WIRG.

The apparatus is very seldom used, as it often gets out of order since it is easily affected by moisture.

The engineers consider the apparatus practically useless.

E. Apparatus P.R.7.

A new apparatus constructed in 1947 by German engineers. It is practical because of its light weight, ease of handling, and sensitivity.

It is used particularly for laboratory work.

This apparatus operates with a sound that is more or less intense and continuous according to the intensity of the radioactivity.

Undoubtedly, the Russians are working on new apparatus in Russia at the present time.

There was formerly a plant on the German-Czech border which was engaged in the extraction of uranium from pitchblende. However, toward the end of 1946, the Russians dismantled the plant completely and sent the material and machinery to Russia.

There is no plant in the Czechoslovak Republic at the present time which is working on uranium because all the railroad cars (loaded with uranium ore) are destined for Russia via Moscow.

The actual destination is a closely guarded secret, as very few of the Russian workers are aware of it. The destination is probably one of the Stalin plants in Ukraine or beyond the Urals.

The apparatus recently built by the Russians and copied from German equipment are all made and tested in the Urals.